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CLAIMS

1. A method of design comprising the steps of:

   (a) parameterising a design space according to a set of parameters;

5   (b) creating a parent population of relationships by random selection amongst the set of parameters;

   (c) encoding the parent population into a population of functional elements, each functional element comprising terminal nodes and functional nodes and having a signature that corresponds to the total

10   of terminal nodes and functional nodes;

   (d) grouping functional elements into clusters according to the similarity between functional elements;

   (e) creating an offspring population of functional elements by performing genetic operations on the parent population; and

15   (f) reporting results by grouping functional elements into clusters according to step (d) above, ranking the complexity of functional elements according to their signature and presenting a plurality of functional elements from the clusters according to the ranking.

20 2. The method of claim 1, wherein the functional elements are grouped into clusters to minimise the average distance between functional elements in the cluster.

25 3. The method of claim 2, wherein the distance between functional elements is calculated by firstly creating, for each of the functional elements of the pair, a vector comprising a frequency count of each different terminal node and each different functional node in the pair of functional elements and then by taking the absolute difference between the vectors.

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4. The method of any preceding claim, wherein a fitness value of a functional element is determined in accordance with how favourably the functional element compares to the design space.

5   5. The method off claim 4, wherein the fitness value is determined such that it is inversely proportional to the length of the functional element.

6. The method of any preceding claim, further comprising evaluating the aptness of functional elements within a pair for a recombination genetic
10   operation by determining a correlation factor proportional to their similarity and wherein step (e) includes performing recombination genetic operations of pairs of functional elements selected according to their correlation factor.

7. The method of claim 6, wherein a correlation factor for each functional
15   element of the pair is determined that is inversely proportional to the length of that functional element.

8. The method of claim 6 or claim 7, wherein step (c) comprises encoding the functional elements to have tree structures of terminal and functional nodes
20   and wherein recombination of functional elements is performed by swapping sub-trees between the pair of functional elements.

9. The method of any of claims 6 to 8, wherein recombination is performed only between functional elements that are members of the same cluster.

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10. The method of any of claims 6 to 8, wherein recombination, is performed between functional elements that are members of the same cluster before being performed between functional elements that are members of different clusters.

11. The method of any preceding claim, wherein step (c) comprises encoding the functional elements to have tree structures of terminal and functional nodes and wherein step (e) includes performing mutation genetic operations of functional elements by substituting a sub-tree with a randomly-generated sub-tree.

12. The method of any claims 4 to 11, wherein step (e) includes performing elitism genetic operations by retaining functional elements with the highest fitness values unchanged.

13. The method of any preceding claim, wherein step (e) includes performing introduction genetic operations by introducing new randomly-generated functional elements.

14. A method according to any preceding claim, wherein steps (d) and (e) are repeated to produce successive offspring populations, the preceding offspring population acting as the parent population for each genetic operation step.

15. The method of claim 14 when dependent upon claim 4, wherein steps (d) and (e) are repeated successively until a single fitness value or a predetermined plurality of fitness values above a certain threshold level is or are achieved.

16. A method of design as substantially described hereinbefore with reference to any of Figures 1 to 4 of the accompanying drawings.

17.A computer for use with the method of any of claims 1 to 14, when programmed to perform steps (a) to (f).

18.A computer program product comprising program instructions for causing a computer to operate in accordance with claim 17.